# LA-UR-22-21131

**Approved for public release; distribution is unlimited.**

| | |
|---|---|
| **Title:** | Operational and Mission Highlights A Monthly Summary of Top Achievements January 2022 |
| **Author(s):** | Anaya, Lillian Marie<br>Adkins, Kenneth Brian |
| **Intended for:** | Monthly Newsletter |
| **Issued:** | 2022-02-09 |



LA-UR-22-XXXXX

Los Alamos
NATIONAL LABORATORY

# Operational and Mission Highlights

A MONTHLY SUMMARY OF TOP ACHIEVEMENTS

January 2022

# Contents

## NUCLEAR SECURITY



## SCIENCE, TECHNOLOGY, AND ENGINEERING



## MISSION OPERATIONS

## COMMUNITY RELATIONS

NUCLEAR SECURITY

## Engineering Evaluations Conducted for Pit Production

The Laboratory is making progress toward solidifying pit-manufacturing processes for the first production unit (FPU). Resources from across the Laboratory have supported acceleration of Engineering Evaluation (EE) preparation, execution, and closeout for pit production. Results from the collaborative effort are being realized.

In December 2021, five Engineering Evaluations (EEs) were initiated. The EEs are important because the design agency, Lawrence Livermore National Laboratory, is validating that processes will meet specifications for builds. The December EEs included an observation EE and four document reviews covering gas operations, parts radiography, and photography. An EE for trace elements is planned for January 2022.

## John Benner to Lead Weapons Production at Los Alamos National Laboratory

The Laboratory announced that John Benner is the new Associate Laboratory Director for Weapons Production (ALDWP), effective January 3, 2022. Brenner replaces Dave Eyler, who retired from the position this fall. Benner is currently executive officer for the Weapons program.

ALDWP and its 1,400 employees are responsible for a diverse production portfolio that includes the production and evaluation of plutonium pits, nuclear weapon detonators, and other nonnuclear components. ALDWP also oversees plutonium processing and disposition, manufacturing of power supplies for NASA deep-space missions, surveillance, materials management, and waste operations.

As the ALD for WP, Benner will work closely with others across the Laboratory and the entire nuclear weapons complex. Benner will take over the role from acting ALD David Dooley.

## Laboratory LDRD Projects Selected in Support of Plutonium Research

Under the Actinide Strategy Rapid Response call, three projects based out of the Laboratory's TA-55 and its Plutonium Facility have been selected for the Laboratory-Directed Research & Development (LDRD) funding Director's Initiative. Of the six projects chosen for this call, three of them involve ALDWP (Associate Laboratory Directorate for Weapons Production) employees as principal or co-investigators:

- Ultra-High Resolution Gamma Spectroscopy for Plutonium Facility Materials Characterization
- Uranium Quantification in Electro-decontamination Samples via XRF (X-ray fluorescence)
- Robust Autonomous Realtime Gas Monitoring of Safe Nuclear Waste Storage at TA-55

These projects, along with many others selected for various calls across the Laboratory, will perform R&D to increase knowledge of the subject areas and build an understanding of how and why a technique works to support R&D across the Laboratory and the DOE Complex.

## New Shock and Vibration Capability Complete at the Lab's Weapons Component Test Facility

Collaborators from associate laboratory directorates in Weapons Engineering (ALDW), Weapons Production (ALDWP), and Capital Projects (ALDCP) have completed construction on a new shock and vibration testing capability, which is located in building 16-207 (Weapons Component Test Facility).

A successful example of close coordination design collaborating with production agencies, this new construction brings increased capabilities for small-scale high-explosive shock and vibration testing. This capability is instrumental in supporting Detonator Production; the renovations were initiated to support 4E10 detonator production, but the potential has expanded to support Alt 940 cables, MC5108 Detonators, and future detonator products.

In addition to the facility upgrade, E-14 (Test Engineering) and detonator production (DP) have been collaborating to create a pipeline to test DP products safely, efficiently, and reliably, as well as ensure the stringent quality requirements and product specifications issued by design agencies are met. The facility upgrade and the ability to provide DP with War Reserve (WR) environmental testing down the road will help reduce production schedules and increase mission-critical workspace at the Laboratory.

With this new capability in place, the Laboratory can more efficiently and effectively perform vibration test-

ing to support the needs of ALDW, ALDWP, and other customers.

## Pit Technologies Closes the Year with Pit-Build Successes

The Laboratory's Pit Technologies (PT) groups made significant progress in the last month of the 2021 calendar year, before the winter closure. For example, Pit Build 26 was completed during the first week of January 2022 and is now ready for radiography during the first week of January 2022. Pit Build 27 final assembly operations were completed, with ongoing operations also scheduled for early January 2022.

Nine electrorefining ring (ER) runs were completed, with personnel tracking the ER yield and success rate. Three shape castings were produced, and parts prepared for drill and press/braze operations were set to commence. In addition, Pit Build 25 has been parted and is ready for coring and preparation of certification cores/test articles.

Priorities across PT for January 2022 include production of Pit Build 28, along with metallography and characterization of Pit Build 25; characterization supporting cast and heat treatment engineering evaluations; improvements in plutonium girth welding; optimizing the tube braze; and yielding units that meet CERT05 and CERT07 requirements.

## Plutonium Pit Production Subproject Receives CD-3A Approval

On January 3, 2022, the Los Alamos Plutonium Pit Production Project (LAP4) 30 base subproject received Critical Decision 3A (CD-3A) approval from the NNSA Deputy Administrator for Defense Programs. This approval enables LAP4 personnel to procure long-lead equipment items required to achieve a 30-pits-per-year base capacity. Long-lead items can consists of equipment, services, and/or materials that must be procured well in advance of need because of long delivery times.

Upon authorization, this first portion of LAP4 30 base, which represents the modernization of the TA-55 footprint and production capability, will initiate up to $72 million for the long-lead procurement and fabrication of gloveboxes and standalone equipment for subsequent installation at the Laboratory's Plutonium Facility (PF-4).

## Scanning Completed for Radiochemical Detector Data for All LANL and LLNL Historic Above-Ground and Underground Events

During the past year (2021), Los Alamos National Laboratory added more than 3,549 documents to the digital archive, fully digitizing all radiochemical detector information in all shot folders from Los Alamos (LANL) and Lawrence Livermore (LLNL) national laboratories. LANL finished scanning all radiochemical detector data for every LANL and LLNL underground testing (UGT) event, including 1,375 reports, 1,518 memos, 408 notes, and 248 blueprints. This data will be entered in a database that can be used to access approved Radchem Data for incorporation in the weapons program workflow. Historic UGT data are used by LANL and the nuclear weapons complex to benchmark and verify codes.

SCIENCE, TECHNOLOGY, AND ENGINEERING

## De Melo Selected for the Postdoc Council Pilot Program of the National Postdoc Association

The National Postdoctoral Association (NPA) announced the launch of the Postdoc Council Pilot Program. Postdoc Research Associate Leonardo de Melo, who works with the Quantum Technologies Team within Materials Physics and Applications–Quantum, will serve on the inaugural committee.

Service on the council is exclusively for current postdocs. The selection committee chose twelve members this inaugural year, with members representing a broad spectrum of research disciplines, institutional settings, geographic regions, demographic groups, and professional experiences.

De Melo served two terms as the president of the Los Alamos Postdoc Association. Before that, De Melo served as the social chair. He also currently serves on the APS-IDEA (American Physical Society's Inclusion, Diversity, and Equity Alliance) working group.

The Postdoc Council Pilot Program will serve to elevate the voice and input of postdocs in implementing NPA initiatives. Postdocs serving on the Postdoc Council Pilot Program will have the opportunity to further develop skills in committee work, leadership, networking, strategic planning, and team building.

## Employee's Initiative, Expertise, and Service Enhances Laboratory's ASME Coordination

On January 14, 2022, Joshem Gibson of Integrated Weapons Experiments joined the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Subgroup on High Pressure Vessels. This invitation-only position represents a key communication and coordination channel between ASME and the Laboratory. This opportunity comes at a pivotal time during the development of impulsively loaded pressure vessels, also known as explosive confinement vessels.

The Laboratory benefits in many ways by having an employee serve on the ASME B&PV subgroup. For example, Gibson can help the Laboratory stay informed about ASME's potential changes to guidance and recommendations that affect the design and use of impulsively loaded vessels. He can also inform ASME of the Laboratory's unique application and design plans.

The Laboratory's pressure vessels must follow ASME codes and standards. Although most industries design and use vessels for static pressure operations, the Laboratory requires designs that support highly impulsive, time-dependent pressure transients. Applying his extensive expertise, Gibson can speak to the Lab's specific applications for impulsively loaded vessels, and he can recommend that industry codes and standards be developed for the highly dynamic structural response exhibited by Laboratory-driven vessel operations.

Gibson's expert knowledge fills an important niche at the Laboratory. The Lab has not built six-foot impulsively loaded vessels since the early 2000s, and many of the previous designers and manufacturers have since retired. As plans develop to design and fabricate new pressure vessels, Gibson's expertise helps to ensure continuity at Laboratory, as well as maintain close coordination with ASME.

## Estimating the Strength of Selection for New COVID-19 Variants

Laboratory researchers have developed methods to quantify the transmissibility of new variants of COVID-19 — these methods could have far-reaching implications for public health in terms of COVID-19 risk and the vaccination levels required to obtain herd immunity. Ethan Romero-Severson of Theoretical Biology and Biophysics (T-6) is the lead author of a paper "Estimating the strength of selection for new SARS-CoV-2 variants," published in the December 14, 2021, issue of *Nature Communications*. Romero-Severson and his team showed that it is possible to calculate new strains' transmission advantage from publicly available data while accounting for alternative explanations such as migration and random genetic drift. Their collection of methods enables them to look both broadly at the global situation and in greater detail at specific countries using publicly available genetic sequence data.

## Laboratory Enters into Agreement with the State of New Mexico and Sandia National Laboratories to Develop Zero-Carbon Hydrogen

Los Alamos and Sandia national laboratories have agreed to a Memorandum of Understanding (MOU) with the New Mexico Economic Development Department; Energy, Minerals, and Natural Resources Department; and Environment Department. Under this MOU, the national laboratories will build a zero-carbon hydrogen economy not only for New Mexico but also across the United States.

This MOU takes advantage of national laboratory expertise to deliver timely material and efficient transformation of energy systems to (1) achieve economic prosperity, (2) reach net zero emissions by 2050 economy-wide, and (3) reduce greenhouse gas emissions in New Mexico at least 45 percent below 2005 levels by 2030. The MOU identifies the following areas of cooperation:

- Zero-Carbon Hydrogen Generation from Methane and Biomass;
- Zero-Carbon Hydrogen Generation using Concentrating Solar Power;
- Zero-Carbon Hydrogen Generation from Brackish and Saline Waters;
- Large-Scale Hydrogen Storage; Hydrogen Distribution;
- Production of Carbon-Neutral Alternatives to Petroleum-Based Products;
- Direct Air Capture of $CO_2$;
- Fit for Purpose End-Use Applications; Safety, Codes and Standards; and
- Monitoring; and Lifecycle Analysis of Zero Carbon Hydrogen Emissions.

With the MOU signed, each party must identify lead coordinators to facilitate the overall planning and implementation of this partnership, including quarterly meetings, the formation of technical workgroups, technology transfer within the public and private sectors, and the development of New Mexico's zero-carbon hydrogen workforce.

## Laboratory Hosts Impactful Multi-Division Booth at World's Largest Science Conference

The Earth and Environmental Sciences (EES) Division developed and hosted the Laboratory's exhibit hall booth for the American Geosciences Union (AGU) annual meeting. Staffed by members from EES; National Security Education Center; Intelligence and Space Research; Analytics, Intelligence, and Technology; Theoretical Division; and Computer, Computational, and Statistical Sciences, the booth targeted recruits and provided information about all of the Laboratory's opportunities and capabilities in Earth and space science.

Although the only national lab booth, LANL's booth was one of the largest and best attended. More than 1,000 people visited the booth, including many prospective students and staff guided to apply for positions. As a result, Laboratory representatives launched relationships with collaborators and industrial, academic, and government colleagues. The Laboratory's concurrent outreach included press pitches, column placements, social media campaigns, AGUTV and LANL news videos, and press conferences (e.g., promoting data and publications resulting from our 2020 Antarctic campaign).

A hybrid online and in-person event impacted by COVID-19 constraints, the conference nevertheless had more than 10,000 attendees present (more than 30,000 total) in New Orleans on December 12–17, 2021. Strict safety protocols were observed.

## Laboratory Plans to Vet New Biodosimetry Approaches

Laboratory scientists plan to evaluate a novel technology associated with a new program designed to assess methods that detect radiation exposure. Known as the Targeted Evaluation of Ionizing Radiation Exposure (TEI-REX) program, this R&D effort sponsored by the Intelligence Advanced Research Projects Activity (IARPA) has been tasked to develop innovative biodosimetry approaches, particularly for low-dose radiation exposures.

Although direct detection of radionuclides is largely a solved problem, the biological effects of low-dose radiation can be difficult to detect. However, a promising research direction suggests that biomarkers associated with ionizing radiation exposure can be detected in proteins, peptides, metabolites, and lipids. Laboratory scientists, collaborating with colleagues at Lawrence Berkeley National Laboratory, will draw on decades of experience in such fields to aid IARPA in assessing the approaches pursued by TEI-REX program participants.

Laboratory scientists intend to support the IARPA program by leveraging the Laboratory's rare combination of expertise in the fields of radiation exposure, organs-on-a-chip, mass spectrometry, and integrated multiomics — a new biological tool in which data from different omic groups (such as the genome, proteome and microbiome) are combined during analysis.

## Lab Researchers Publish In-Depth Articles on the Trinity Test

On November 16, 2021, Laboratory researchers published two dozen papers in a special issue, titled The Manhattan Project Nuclear Science and Technology Developments at Los Alamos, of the journal *Nuclear Technology*.

This issue (volume 207) explores nuclear science at the time of the Trinity Test, and it represents the most in-depth analysis ever completed, with never-before-seen info and data, introduced and organized by Weapons Physics Chief Operating Officer Mark Chadwick.

Nuclear Technology is an international research journal published by the American Nuclear Society (ANS). See journal articles here: https://www.tandfonline.com/toc/unct20/207/sup1.

## New Codes Provide More Accurate Modeling for High Explosives

In December 2021, Advanced Simulation and Computing (ASC) scientists at the Laboratory completed writing and modularizing a modified shock-fitting code. Using this code, scientists can now predict with greater accuracy what happens to a high explosive when it is shocked — a once-difficult task.

The codes must account for small pores that form as high explosives are pressed. Accurate predictions

also depend on how well the shock front is resolved in calculations, how it is detected, the calibration of the Equation-of-State for the active part of the high explosive, and the kinetics for the conversion of the high explosive reactants into the detonation product.

The new code allows for decoupling the shock propagation from the calibration when running predictive models for high explosives. This computational advance is an important step in providing evaluation of high explosives of different compositions and densities, both of which enable personnel to make material-production decisions.

The idea to write a new code came in response to a verification evaluation of reactive burn models in the Laboratory's ASC codes. This evaluation indicated that an improvement in the way a shock front was calculated and propagated through a high explosive would be beneficial.

## Op-Ed: Coalition Will Power Move to a Carbon-Neutral New Mexico

On January 17, 2022, the *Albuquerque Journal* published an op-ed by John Sarrao, Deputy Director for Science, Technology, and Engineering. This opinion piece addressed the Intermountain West Energy Sustainability & Transitions (I-WEST) coalition and included discussion about the importance of embracing a science-based and community-supported roadmap toward a carbon-neutron future.

Sponsored by DOE and led by the Laboratory, the I-WEST coalition brings together states, regional universities and colleges, research institutions, local communities, and tribal entities to create a sustainable-energy economy. Through workshops and outreach activities, I-WEST will partner with local communities throughout the Rocky Mountains, including sovereign Native American nations, to learn about their unique concerns and needs regarding jobs, energy use, and environmental stewardship.

Guided by such grassroots input, the Laboratory and its partners will apply their scientific and technical expertise to take advantage of a diverse portfolio of renewable energy resources to achieve 100 percent carbon neutrality in 15 years. Achieving this objective will involve repurposing existing energy production infrastructure, as well as protecting the jobs of energy workers and supporting them in developing new skills to build high-quality careers in the emerging $CO_2$- and hydrogen-based economy.

## Three Laboratory Scientists Named 2021 AAAS Fellows

Three Laboratory scientists were recently named Fellows of the American Association for the Advancement of Science (AAAS): **Babetta Marrone** (Bioenergy and Biome Sciences), **Thomas Mark McCleskey** (Chemistry Division), and **Harshini Mukundan** (Physical Chemistry & Applied Spectroscopy). Election to AAAS fellowship is an honor bestowed upon AAAS members by their peers for their scientifically or socially distinguished efforts to advance science or its applications.

**Marrone** was named a Fellow in Industrial Science & Technology for distinguished contributions of multidisciplinary experimental and computational approaches that provide life science solutions to energy and national security applications. She is a senior scientist at the Laboratory's Bioscience Division, Bioenergy and Biome Sciences Group.

**McCleskey** was named a Fellow in Chemistry for the development of polymer-assisted deposition of thin film coatings, the elucidation of a new paradigm in beryllium binding, and enlightened chemistry leadership at a national laboratory. He serves as the division leader for the Laboratory's Chemistry Division.

**Mukundan** was named a Fellow in Chemistry for pioneering the understanding of the biochemistry of interactions between pathogen amphiphiles and host lipoproteins, as well as the development of novel spectroscopic assay modalities for their detection. She is the group leader for Physical Chemistry and Applied Spectroscopy at the Laboratory, and she is an adjunct professor at the University of New Mexico and affiliate scientist at the New Mexico Consortium.

## Unprecedented Multiscale Model Links Protein Behavior to Cancer-Causing Mutations

A multi-institutional team of scientists has developed a highly detailed, machine-learning-backed multiscale model that reveals the importance of lipids to the signaling dynamics of RAS, a family of proteins whose mutations are linked to numerous cancers.

The team, which includes co-author and lead Gnana Gnanakaran of the Laboratory's Theoretical Biology and Biophysics (T-6), worked closely with Lawrence Livermore National Laboratory and the National Cancer Institute's Frederick National Laboratory for Cancer

Research (FNLCR) on connecting these multi-scale simulations to the RAS biology, The connections were made through biophysical interpretation and analysis of the simulations.

The paper, titled "Machine learning–driven multiscale modeling reveals lipid-dependent dynamics of RAS signaling proteins," was published in the *Proceedings of the National Academy of Sciences* (PNAS) on January 4, 2022.

MISSION OPERATIONS

## Actinide Operations Team Coordinates First Cement Powder Mix Delivery in More Than a Decade

Before the 2021 winter closure, personnel refilled a silo at TA-55 with Portland cement powder — this is the first time in more than a decade that such work has been carried out. To dispose of liquid transuranic waste generated within the Plutonium Facility (PF-4), the Aqueous Nitrate Recovery Team in the Actinide Material Power & Processing Division neutralizes the waste and mixes it with Portland cement powder inside 55-gallon drums. When the cement hardens, it effectively locks the actinide and heavy metal elements away in an impermeable solid suitable for discard at the Waste Isolation Pilot Plant (WIPP).

The dry cement powder is conveniently stored in a silo that sits adjacent to PF-4, providing a ready supply of enough cement to solidify 30 to 40 drums. But when the silo is emptied, it must be refilled. Unfortunately, the silo was last filled in May 2011, so everyone involved with the previous purchase had since retired.

The Aqueous Nitrate Recovery Team had to rediscover how to navigate the maze of Quality Assurance (QA) and security requirements required to transport a truck with a 40-ft trailer onto the TA-55 protected area. On December 16, 2021, at 7:30 a.m., the team headed to a cement plant outside of Albuquerque to witness the truck being filled, after which the team escorted it to Los Alamos. After badging the driver and getting the required inspections completed, the driver and truck were finally able to begin pneumatically transferring seven tons of Portland cement into the silo at 4:30 p.m., completing the task just before dusk.

## Capital Projects, Plutonium Infrastructure Collaborate to Offer 413.3B Training Resources

The Laboratory's Capital Projects and Plutonium Infrastructure directorates have formed a new collaborative team to offer project managers comprehensive training. This training is designed to improve management's knowledge of DOE Order (O) 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. A two-day course, Project Management for Line Item Capital Projects is the first in the series and serves as an introduction to DOE O 413.3B and LANL Project Management AP 350 101-501 series.

The training curriculum is available on the Laboratory's internal website and is designed to bring project managers real project lessons learned on challenges and best practices. The next session will be held in late January or early February.

## Final Transuranic Waste Shipments for 2021 Set Record-Breaking Pace

Environment & Waste programs have kept ahead of the game on transuranic (TRU) waste shipments throughout 2021 and already during FY22. The final two trucks of TRU waste for the calendar year shipped on December 16, 2021. The decreasing inventory of TRU waste at TA-55 is on the right trend, with inventory at less than 1000 drums, thereby continuing to make room for future production. Waste processing and shipping teams are working at a record-setting pace for shipments, with 19 shipments made so far in FY22.

## Four-Star Admiral Visits the Laboratory to Receive Updates on National Security Missions

On January 11, 2022, Admiral Charles Richard, commander of U.S. Strategic Command (USSTRATCOM) paid a visit to the Laboratory, where he received briefings and a tour of weapons facilities. USSTRATCOM plans and executes military missions involving nuclear weapons, many of which are designed and maintained by the Laboratory.

While visiting with various Laboratory leaders and employees during his trip across the campus, Adm. Richard discussed 2021 milestones and reviewed goals for 2022. In a series of Laboratory briefings, the admi-

ral and his team heard from Global Security's Eric Dors (GS-PROG, Global Security Program Support Office) and the Office of Annual Assessment's Kevin Smale (DDW, Deputy Director for Weapons), before progressing to a weapons program overview provided by Bob Webster (DDW) and a variety of management throughout the Laboratory's weapons programs.

Finally, Adm. Richard and his staff were led on a tour of the Plutonium Facility, where they observed pit production processes and heard from employees who support the pit mission — a mission of great importance to USSTRATCOM and the future of the U.S. stockpile.

The visit was an important marker for the Laboratory, especially after the past two years when the admiral's previously scheduled visits were canceled because of the COVID-19 pandemic. Laboratory leadership was excited to finally welcome Adm. Richard and his team onsite.

## Lab Illustrates Commitment to Employee Safety in Construction Video of New Parking Garage

A new parking garage at Otowi, located near the Laboratory's main administration building, features 450 new parking spaces throughout three floors. This layout offers charging stations for electric vehicles, designated spots for motorcycles, and a parking guidance system that directs employees to floors that have empty spaces.

Employees are likely aware that the Otowi parking garage added much-needed parking. What they might not realize — but what Laboratory leadership knows — is that the Otowi garage illustrates excellence in disciplined operations, also known as Formality of Operations. Before starting construction, crews from Capital Projects and Facilities and Operations, working with subcontractors, complied with a set of considered and well-defined processes. The crews then executed the processes correctly to build the garage safely and compliantly in its slightly condensed yet optimal location.

As an added bonus, the Laboratory's media production team documented this construction project in an entertaining time-lapse video. This video illustrates how multiple organizations at the Laboratory work together every day to meet mission goals.

## Laboratory Launches New Work Locations Policy that Replaces Former Telework Pilot Policy

Effective January 3, 2022, Laboratory Policy P554 (*Work Locations*) is in effect for all Lab employees. This policy replaces the former Laboratory Telework Pilot Program.

Policy P554 provides flexible work options for managers, so that they can position staff to conduct the Laboratory's mission in the best way possible. This new policy's scope enables managers to define where and how employees work — it applies to all Laboratory organizations.

Work-location types include the following: (1) onsite (at Laboratory or leased space), (2) telework (off-site but within a two-hour ground commute), (3) hybrid (combines on- and off-site), and (4) remote (off-site and outside a two-hour ground commute). Managers determine work locations based on the nature of a group's work collectively, the employee's work individually, and the best interests of the Laboratory.

The decision process to ascertain work location includes management considering where each job function can be performed in a safe, effective, efficient, and compliant manner.

When it is beneficial to the Laboratory, managers may approve exempt and non-exempt regular, term, part-time, casual, student, and post-doctoral employees for offsite work, as per P554, *Work Locations*. The Human Resources Division has provided various resources to enable managers to make the best decisions for their group in this example of culture change at the Laboratory.

## Laboratory Rolls Out New Tool to Bolster Security

The Laboratory recently launched a Review Only System (ROSY for short) to conduct document reviews more efficiently but without sacrificing security in any way.

Developed by personnel at the Research Library collaborating with members from the Classification Office, ROSY complements the Laboratory's existing review-and-approval system, called RASSTI, by enabling faster review of information that either is for a limited,

internal audience or does not have scientific or technical information.

Changing workflows affected by the Laboratory's telework posture during the COVID-19 pandemic made ROSY's development particularly worthwhile. Employees who formerly would have asked a fellow group or division member for a quick derivative classification (DC) review now found themselves working from home and using RASSTI to facilitate DC reviews when their internal-circulation-only documents did not require a unlimited release or controlled-publication designation.

ROSY now enables the classification review of memos, emails, proposals, and other types of unclassified documents safely, yielding a lasting record. By simplifying the process for some documents, ROSY helps ensure classification reviews happen consistently in the Laboratory's hybrid working environment.

## Laboratory's Benefits Has Launched New or Expanded Employee Health Benefits in 2022

Human Resources Benefits (HR-BEN) announced its new or expanded health benefits to Laboratory employees during its open enrollment period in the fall of 2021. As of January 2022, Lab employees and dependents will have access to the following new or expanded health benefits — available to those who participate in any Triad-sponsored medical plan:

*New health partners*

- Catapult Health Virtual Checkup is an annual wellness visit with a board-certified nurse practitioner via virtual consultation. Such visits enable employees to receive care from their homes. Everything needed for the consult is mailed to an employee in advance. The employee completes and returns the information so that a nurse practitioner can review it before the consult takes place.
- Learn to Live offers confidential virtual mental-health support for stress, depression, substance use, insomnia, and social anxiety. Employees work with an expert coach to identify their problem, understand how the mind works, and learn and practice skills to address specific problems.

*Expanded (existing) health partner*

- Hinge Health is a digital physical therapy program (previously available), now expanded to include more short-term and preventive treatment options for those with chronic back, knee, hip, neck, or shoulder pain.

## Laboratory's Finance Division Helps Revise DOE's Financial Management Handbook

Directed by Tom Griffin, DOE's Office of Financial Policy and Audit Resolution recently convened a working group to review and revise DOE's Financial Management Handbook, Chapter 15 "Cost Accounting." The working group consists of policy and cost-accounting experts from DOE, the National Nuclear Security Administration, and management and operating (M&O) contractors throughout the complex.

This working group's goal is to ensure that Chapter 15 information is accurate and updated, includes relevant topics, and is useful to both federal employees and M&O contractors. The last revision of this chapter was completed in 2013. Started in November 2021, the revision project should be completed by early summer 2022.

To ensure that the project is manageable, the working group formed subgroups to pay particular attention to the following topics:

- Production cost accounting;
- Cost allocation for construction projects;
- Materiality and variances;
- Work stoppages;
- Pensions; and
- Laboratory-directed research and development.

Because of the particular importance of production cost accounting and cost allocation for construction projects related to the Laboratory's growing pit production mission, the Laboratory's Finance Division is involved in those two subgroups.

## Laboratory's My Green Video Highlighted in DOE's Sustainability Spotlight Newsletter

The Laboratory's My Green video was recently highlighted in DOE's quarterly newsletter, DOE Sustainability Spotlight. Part of the My Green LANL program, this short video is designed to educate employees about

sustainable practices, such as alternative clean- and green-purchasing, as well as reducing energy and water use. One goal of these practices is to increase savings on operating costs.

Developed by the Laboratory's Sustainability Program in collaboration with a communications team, the video offers simple tips that emphasize reuse, reduce, and recycle. Tips include switching to LED lightbulbs, using bikes and carpooling to travel to and from work, and implementing designated space for shared office supplies. My Green LANL has also partnered with My Green Lab to create sustainable spaces and practices in laboratory settings. The program focuses on the sustainability of four Laboratory elements: energy, water, waste disposal, and chemicals.

Since April 2021, the Director's Office at the Laboratory, along with other employees on the seventh floor of the National Security Sciences Building, completed the My Green LANL assessment; all are currently certified. To become certified, 50 percent of seventh-floor occupants were required to complete the assessment.

Participating offices include the Deputy Director of Operations; the Deputy Director of Science, Technology, and Engineering; the Office of National Security and International Studies; the Global Security Program Office; the Defense Security Program; the Office of General Counsel; and Communications and External Affairs.

## Laboratory's New Traffic News Hub Consolidates Updates on Road Work so Employees Can Plan Commute, Arrive Safely

On December 9, 2021, the Laboratory launched the Traffic News Hub webpage to better inform employees of road improvements, detours, and traffic delays at the Lab and in the surrounding region.

The Traffic News Hub consolidates announcements and updates on relevant roadwork into a one-stop commuting resource. As the Laboratory continues to improve its infrastructure, the webpage will assist the Lab's growing workforce to plan their commutes to work and home, enabling all employees to arrive safely at their destination.

To access the latest updates, go to the webpage and click on the icon of a blue car, which is at the top of the LANLInside homepage next to the Fire Danger Rating.

The Traffic News Hub also features links to the Parking at LANL and Utilities and Infrastructure homepages, as well as access to Los Alamos County's MyDrive page. The Laboratory's driveit.lanl.gov and the county's MyDrive page provide real-time information on traffic situations at major intersections throughout Los Alamos and White Rock.

## Modern, Modular Building New Home for Weapons Staff

Construction on the Ivy Castle Building, which houses 120 Weapons Physics and Engineering employees, was completed — under budget — in November 2021. On December 8, 2021, a ribbon-cutting event was held to celebrate its completion. In January 2022, employees will move in to the new facility, located "behind the fence" near the Nuclear Security Sciences Building.

A two-story, 22,700 square-foot modular structure, the Ivy Castle Building is one of several of this type under construction at the Laboratory. With modular buildings, the pieces are fabricated off-site — in this case, Texas — and then shipped to the construction site, where they are assembled and finished to meet the specifications of the programs they support.

Scientists and engineers will have a modern space in which employees can hold discussions and interactions essential to solving the complex, interdisciplinary challenges they tackle each day. Ivy Castle adds an important piece of infrastructure to the campus in support of the Laboratory and its growing mission.

The building's name comes from two historical references: Ivy is the 1952 nuclear test operation where the Laboratory first demonstrated the principle of a hydrogen bomb, and Castle is the 1954 operation where the Lab first demonstrated the principle of practical, deliverable hydrogen bombs.

## New Badge Office at TA-55 Brings Services Closer to Employees Along the Pajarito Corridor

On January 18, 2022, the Laboratory's Personnel Security group (SED-DO) opened a second badge office on the fourth floor of the Radiological Laboratory Utility Office Building at TA-55. Services at this new badge office include certificate updates, pin resets, and card updates.

The office, which includes three badging stations, serves only current badge holders, with new employees and Laboratory visits still handled at the main office at Otowi for processing. Although all Laboratory employees throughout the complex are welcome to schedule appointments, the office is expected to help more than 3,500 employees working in the Pajarito Corridor who must devote precious work hours to meet the pit production mission at TA-55, particularly those working inside the Plutonium Facility.

The Associate Laboratory Directorate for Plutonium Infrastructure led the six-month construction project, coordinating with Network and Infrastructure Engineering and Personnel Security.

## Packaging Teams for TRU Waste Prioritize Work, Keep Production Moving

In mid-January 2022, packaging teams for transuranic (TRU) waste completed necessary packaging jobs amid decreased personnel resulting from the COVID-19 pandemic. The Laboratory's Nuclear Process Infrastructure (NPI-6) group is solely responsible for packaging all TRU waste generated at TA-55 and surrounding communities.

COVID-19-related issues caused delays in packaging and moving materials, thus having the potential to detrimentally affect operations at the Plutonium Facility (PF-4) at TA-55. To maintain disciplined conduct of operations, personnel in NPI-6 consulted with all affected operating groups to identify specific jobs that could significantly affect weapons program operations if they were not completed as scheduled.

As the teams began to address these two key jobs, one qualified employee who now supports training programs in the Operational Readiness and Implementation (ORI) Division volunteered to come into the facility and oversee the packaging when other staff members were unavailable. This willingness to share employee skills across groups — and divisions — is an example of cultural enhancement in the weapons production space, with an increased focus on teamwork and collaboration.

Thanks to that key individual lending his time to a partner division and the skillful employees on the team, the packaging and material moves were completed without any injury or abnormality. Detrimental impacts from the COVID-19 pandemic have slowed down work in many groups in PF-4 in January 2022. However, creative problem solving and cooperation between ORI and NPI enabled vital waste packaging and container movement to continue in a compliant manner.

## ParkIT App for Laboratory Devices Helps Employees Find Nearby Parking Spaces

To support the opening of the new Pecos Parking Garage, which provides 450 new spaces at the Laboratory's busy Pajarito Corridor, the Facilities and Operations Directorate unveiled a mobile application known as ParkIT. Designed for Laboratory iOS devices, this app makes it easier to find available parking spaces across all parking garages at the Laboratory. Employees simply download the app to their Lab devices — once opened, the app can see in real time the number of spots at a garage closest to their work location.

The ParkIT app complements the overall parking guidance system driven by digital-display signs. These signs, located at the entrance to each garage, list the number of available spaces on each floor. The displays are updated within five to 10 seconds of a vehicle being detected in a particular zone. Additional signs on Pajarito Road and Diamond Drive inform drivers of the number of parking spaces at each garage.

The ParkIT app and digital signs are operational examples of how the Lab takes advantage of technology to help employees arrive at work on time and as safely as possible.

## Renovated JRO Collaboration Space Makes Working Together Easier

As Laboratory employees adapt to remote and hybrid work situations, personnel at the Laboratory's Collaboration Space in the J.R. Oppenheimer (JRO) Study Center have enhanced it to foster further a welcoming culture of collaboration. These enhancements include seating options that encourage teamwork, more drop-in locations, a Help Desk, and self-serve Provisions on Demand market.

The modular furniture in the Collaboration Space accommodates a changing workforce that is on the go more between home offices and hybrid office setups. The Collaboration Space has connections for laptops, computer terminals, printers, and various open-seating

options. These options include tables with swivel chairs or couches, two couches and table bookended with short walls, tall chairs at four- and six- person tables, and a two-person cubicle called a framery that is designed for private conversations.

Closed to the public, the JRO building is now only open to badge holders. All Laboratory visitors must first visit the Badge Office to gain access. Additionally, the Collaboration Space and all other services in the building follow all Lab guidelines regarding occupancy, masking, etc., to prevent the spread of COVID-19.

## RLUOB Equipment Installation-Phase 2 Project Receives CD-4 Approval

On December 20, 2021, the NNSA Administrator approved Critical Decision 4 (CD-4) for the Chemistry and Metallurgy Research Replacement's (CMRR) Radiological Laboratory Utility Office Building (RLUOB) Equipment Installation-Phrase 2 (REI2). The completion and CD-4 approval of REI2, along with the earlier completion of the CMRR Plutonium Facility (PF-4) Equipment Installation-Phase I project, enable the NNSA Plutonium Strategy by maximizing the use of RLUOB and supporting program milestones to terminate program operations at the aging CMRR facility.

Accomplishments include outfitting 10,000 square feet for laboratory space dedicated to analytical chemistry and materials characterization capabilities; installing and starting up 74 gloveboxes and hoods, as well as more than 850 pieces of equipment and instruments; and completing a transition to operations and equipment hot testing and validation.

The project was completed under budget by $124 million and approximately two months ahead of schedule. The successful completion of the five-year project (baselined in October 2016) was the result of a collaboration among all the functions and organizations across the Laboratory and NNSA.

To meet the Laboratory and NNSA Plutonium Mission, the next step for RLUOB team is to re-categorize the facility from a radiological facility to a Hazard Category-3 (HC-3) nuclear facility. The RLUOB team successfully completed the management self-assessment in November 2021. The team is on track to start Contractor and Federal Operational Readiness Reviews during the second and third quarters of FY22, followed by obtaining approval for HC-3 operations by the fourth quarter of FY22.

## Transuranic Waste Facility Streamlines and Strategizes Drum Storage

In late November 2021, employees at the Transuranic Waste Facility (TWF) developed and implemented a new systematic approach to drum storage and identification. The change was employee-initiated and was in response to recent occurrences of moving drums that were not yet ready for shipment.

To be more productive and to practice ALARA (radiation exposure as low as reasonably achievable), TWF employees strategized and implemented a new way of doing things. The TWF team collected the information needed to understand and characterize the drums in storage, created spreadsheets by building with detailed location information, and implemented the building reorganization (moving drums to their new locations based on this system) within two weeks.

As a result of this work, drums meant to be in long-term storage are now placed in a separate area from drums ready for shipment — making the latter more accessible and making it visibly clear where each drum belongs. This reorganization will assist the team with identifying drums, moving drums, and preparing the documentation that follows the job to be more efficient and maintain the practice of ALARA and good conduct of operations.

COMMUNITY RELATIONS

## Family Friendly New Mexico Names the Laboratory Among 2021 Platinum-Level Employers

The Laboratory recently received the 2021 Family Friendly Business Award™ — this is the third consecutive year that Family Friendly New Mexico has recognized the enhanced culture at the Laboratory for the implementation of family-friendly policies designed to support employee work/life balance.

Policies cover seven principal areas: (1) paid leave, (2) health support, (3) work schedules, (4) economic support, (5) pay equity, (6) diversity/inclusion, and (7) community investment. Platinum-level recipients,

known as Distinguished Leaders, have policies in categories 1–4 and at least one policy in categories 5–7.

Award selection is based on how businesses integrate several laws designed to promote and protect the rights of women and mothers in the workplace. These laws include the Promoting Financial Independence for Victims of Domestic Abuse Act, the Nursing Mothers' Rights at Work Act, and the Fair Pay for Women Act.

A nonprofit initiative, Family Friendly New Mexico recognizes New Mexican businesses that acknowledge the importance of work/life balance. The Albuquerque-based group supports businesses that adopt family-friendly policies that in turn help attract loyal and qualified employees to the state.

## New Data Demonstrates the Laboratory's Beneficial Impact to New Mexico's Economy

New data for FY21 shows the Laboratory's big impact on New Mexico's economy. In FY21, the Lab employed 12,919 people — a total of $1.3 billion in salaries — and spent $505 million with businesses statewide. The Laboratory prioritizes establishing contracts with businesses in New Mexico, including small business that are disadvantaged, owned by minority groups, and/or located in areas in need of economic development. In FY21, the Lab spent the following in the state*:

- Disadvantaged small business: $158,249,718;
- HUB zone-located small business: $44,740,926;
- Native American small business: $4,970,394;
- Veteran-owned small business: $25,627,635;
- Women-owned small business: $122,791,794; and
- 8(a) NM small business: $1,697,694.

*Note that a given business may fit into more than one category.

In the coming years, the Laboratory intends to expand spending in the above categories as it works toward aggressive goals for collaborating with more small businesses. Laboratory employees spend their salaries — a collective $1.3 billion — primarily in their home communities. With 60 percent of Laboratory employees living outside Los Alamos County, these dollars are distributed throughout northern New Mexico.

In FY21, the number of Laboratory employees reached 12,919 (not including contractors), up from 12,367 in FY20. As of the end of FY21, 40.2 percent of Laboratory employees were native New Mexicans. Furthermore, 30.2 percent of employees have at least one degree from a New Mexico college or university.

## Second Annual Northern New Mexico Data Sprint Issues Call for Applications from Regional Nonprofits and Social-Good Organizations

The second Laboratory-organized Northern New Mexico Community Data Sprint, which takes place in the summer of 2022, has issued a call for applications from community partner organizations. This weeklong event pairs local nonprofit and social-good organizations with small teams of Laboratory data scientists to solve data-related problems that benefit northern New Mexico.

The sprint is sponsored by the Laboratory's Information Science & Technology Institute and Community Partnerships Office. In 2021, the first year Data Sprint successfully helped Santa Fe Community College, Northern New Mexico College, and the nonprofit Rocky Mountain Youth Corps.

Interested organizations should have their own data, a related question or problem they would like to answer or solve, and at least one representative willing to participate in some planning activities, as well as participating during the week of the data sprint. There is no charge for an organization to participate in the project. The application deadline is January 30, 2022, and more information is available here.

## Web and Print Publications Highlight 2021 Economic Impact of the Laboratory on New Mexico

Just in time for the New Mexico legislative session, a new Laboratory publication (available in both web and print format) outlines the 2021 economic impact of the Laboratory on New Mexico. The report offers a range of data from FY21, with topics that address Laboratory hiring, salaries, procurement, and economic and workforce development programs.

It also highlights demographic information, noting that 40.2 percent of Laboratory employees are native New Mexicans and 30.2 percent of regular/term employees have at least one degree from a New Mexico college or

university. A combined effort from Community Partnerships Office, PPO, Acquisition Services Management, and Communication Arts and Services, the report gathers information useful for multiple stakeholders and makes it available in convenient formats. The online version is here.

## SELECTED MEDIA COVERAGE

**Using Sparse Data to Predict Lab Earthquakes**
*Science Daily (12/17/21)*
A machine-learning approach developed for sparse data reliably predicts fault slip in laboratory earthquakes and could be key to predicting fault slip and potentially earthquakes in the field. The research by a Los Alamos National Laboratory team builds on their previous success using data-driven approaches that worked for slow-slip events in earth but came up short on large-scale stick-slip faults that generate relatively little data — but big quakes.

**LANL Delivers Upgraded Office and Parking Space: New Facilities Just In Time for the New Year**
*Los Alamos Reporter (12/22/21)*
Laboratory employees working in nuclear stockpile stewardship and global security are closing out 2021 with modern, efficient office and parking space thanks to new structures revealed at December ribbon cuttings.

**LANL: Top Science Stories of 2021**
*Los Alamos Reporter (12/26/21)*
Despite the year's many challenges (and, in some cases, because of them), there were some incredible scientific and technological innovations out of Los Alamos in 2021. Here's a look back at just a few of them.

**New Threat to California Forests: Climate-Supercharged Beetles**
*San Francisco Chronicle (12/29/21)*
There's new thinking on why extraordinary numbers of trees have died in the Sierra Nevada over the past decade, leaving vast swaths of evergreen forest a dingy orange and brown.

**Army, Navy Lend Muscle to New 2-D Perovskite Solar Cell That's 18% More Efficient**
*CleanTechnica (1/3/22)*
The US Department of Defense has been pivoting into a climate action posture, and that includes support for new clean tech. In the latest development, both the Army and the Navy have lent their financial firepower to a new 2-D perovskite solar cell research project. The Energy Department also chipped in with a hand from its Los Alamos, Argonne and Brookhaven laboratories.

**LANL Giving Campaign Raises $2.7 Million for Various Nonprofits**
*Albuquerque Journal (1/3/22)*
Employees of Los Alamos National Laboratory "dug deep and donated more than $2.7 million during the recent giving campaign to make things a little brighter for a variety of nonprofits and those in need in northern New Mexico."

**Los Alamos National Laboratory Launches Road Trip in 2022**
*Los Alamos Daily Post (1/3/22)*
On a recent December morning, Los Alamos National Laboratory (LANL) Director Thom Mason, LANL leaders, and Los Alamos County partners gathered at the White Rock Visitor Center to celebrate the launch of Challenge Tomorrow, a new traveling educational outreach and community engagement program. Think of it as "LANL: The road trip".

**LANL Scientists Analyze Omicron Variant**
*KOB 4 News (1/5/22)*
Scientists at Los Alamos National Laboratory say the Omicron variant and changing human behavior are two big variables to predict what's coming next in the pandemic.

**Climate Change Could Enable Valley Fever to Spread Across More of Western U.S.**
*Yale Climate Connections (1/6/22)*
[Morgan] Gorris's research shows that if carbon pollution continues to rise, temperatures could warm up enough for [valley fever] to spread across much of the Western U.S. by the end of the century, including communities that have never experienced the disease before.

**LANL Top Science Stories of 2021**
*Los Alamos Daily Post (1/6/22)*
Despite the year's many challenges (and, in some cases, because of them), there were some incredible scientific and technological innovations out of Los Alamos National Laboratory (LANL) in 2021.

**Year-In-Review: How LANL Made a Difference in 2021**
*Los Alamos Daily Post (1/6/22)*
As 2021 came to an end, Los Alamos National Laboratory (LANL) took a look back at the ways it made a difference from boosting businesses to building an economic hub.

**Real Shooting Stars Look a Lot Different Than You'd Expect**

*Popular Science (1/9/22)*

The story of hypervelocity stars begins in 1988, when Jack Gilbert Hills, a theoretician at Los Alamos National Labs, had an inspired idea: What would happen if a binary star system — that is, two stars that are gravitationally bound to each other and orbit a common center of mass — traveled near the massive black hole at the center of the Milky Way? Hills calculated that the tidal force of the black hole could rend the binary system in two.

**How It Started vs. How It's Going: A New Look at Earth's Lightning**

*WDRB.com (1/10/22)*

Scientists from Los Alamos National Laboratory and the University of Alabama-Huntsville published an updated map in March 2021. Researchers from NASA's Marshall Space Flight Center released a similar map of lightning activity, based on three years of ISS LIS observations, in July 2020.

**Living with COVID-19: How the Virus Could Turn into the Common Cold, or Something Far Worse**

*San Jose Mercury News (1/10/22)*

The COVID-19 virus might seek to become more stealthy, like tuberculosis or HIV, with a longer "silent" phase of infection, noted Kamil and Relman. Or it could become even more transmissible, like measles. …
And there are parts of the immune response, such as virus-killing T cells, that would target all variants, said Bette Korber of Los Alamos National Laboratory, who tracks the evolution of the COVID-19 virus.

**One of the Last Great Mysteries of the Early Universe**

*The Daily Galaxy (1/11/22)*

The first-of-its-kind simulation, reported in the journal Nature Astronomy, suggests that direct formation of these black holes would be accompanied by specific kinds of intense radiation, including X-rays and ultraviolet emission that would shift to infrared by the time they reach the telescope. The research was supported by NASA, the Los Alamos National Laboratory, the National Science Foundation, the Southern Regional Education Board, and two Hubble theory grants.

**Op-Ed: LANL Continues Its Tradition of Community Support**

*Frances Chadwick — Albuquerque Journal (1/11/22)*

To accomplish this, the laboratory partners with a robust group of local nonprofits that have significant experience and expertise in their fields. We have multiple partnerships to help tackle the region's biggest challenges, among them the Food Depot, the Los Alamos National Laboratory Foundation, the Regional Development Corp. and the United Way of Northern New Mexico.

**Chadwick: Better Together — Los Alamos National Laboratory Employees Collaborate With Area Nonprofits**

*Los Alamos Daily Post (1/13/22)*

The Laboratory's Community Partnerships Office works full time to foster nonprofit giving, economic development, and education in the seven-county area surrounding the Laboratory: Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe and Taos. Not surprisingly, these counties are also home to nearly 98 percent of our employees.

**Mysterious Purple Coating Found On Mars Rocks**

*National Geographic (1/13/22)*

Red dust paints Mars in ruddy hues, from the surface to the skies. But NASA's Perseverance rover has spotted swaths of another color among the rusty shades. At nearly every site the robotic geologist visits, the Martian palate includes purple. The color forms a thin, smooth coating on some stones, and it leaves paint-like blobs on others. Still other rocks look as if they've been partially frosted in magenta icing, says Ann Ollila, a geochemist at Los Alamos National Laboratory who presented an early analysis of the coatings at a recent conference of the American Geophysical Union (AGU).

**Family Friendly New Mexico Names Los Alamos National Laboratory Among 2022 Platinum-Level Employers**

*Los Alamos Daily Post (1/14/22)*

Albuquerque-based nonprofit Family Friendly New Mexico has just given Los Alamos National Laboratory a 2022 Platinum Award for the Lab's commitment to paid leave, health support, work schedules, economic support, pay equity, diversity/inclusion and community investment. This year marks the third consecutive year LANL has received this honor.

**New Mexico to Work with National Laboratories on 'Hydrogen Economy'**

*Santa Fe New Mexican (1/14/22)*

The state has entered an agreement with New Mexico's two national laboratories to build a hydrogen economy they hope will produce zero carbon to help combat climate change. Three state agencies seek to tap the technologies and expertise of Los Alamos and Sandia national laboratories for the endeavor as Gov.

Michelle Lujan Grisham pursues plans to make New Mexico a hydrogen hub.

**Predicting Earthquakes is not Possible. Yet. But an Intriguing New Approach Shows Promise**
*The Economist (1/15/22)*
Paul Johnson, a geophysicist at Los Alamos National Laboratory, is indeed playing down the predictive potential of what he is up to — it is nevertheless the case that, as part of investigations intended to understand the science of earthquakes better, he and his team have developed a tool that might make forecasting earthquakes possible.

**How Do You Handle a Plutonium-Powered Pacemaker?**
*Wall Street Journal (1/17/22)*
Lawyers working on the hospital's bankruptcy have sought guidance from the Los Alamos National Laboratory's Off-Site Source Recovery Program, which aims to retrieve radioactive material in sealed sources that could pose a risk to national security and public health. Over the years the group has dealt with more than 1,600 pacemakers.

**Op-Ed: Coalition Will Power Move to a Carbon-Neutral New Mexico**
*John Sarrao — Albuquerque Journal (1/17/22)*
By embracing a science-based and community-supported roadmap to a carbon-neutral future, New Mexico and the intermountain West can protect vital energy-sector jobs and create rewarding new employment opportunities, stimulate new clean-energy industries in local communities, and keep tax revenues flowing while transitioning to a sustainable economy.

**Run the Risk: New LANL Research Provides Methods for Early Assessment of COVID-19 Variants**
*Santa Fe Reporter (1/19/22)*
Bette Korber, a theoretical biologist at Los Alamos National Laboratory, had first identified the D614G mutation, named for the amino acid mutation in the virus's spike protein, and co-authored a pre-print paper alerting the world to a new and possibly more transmissible strain.

**State, Labs Seek Zero-Carbon Hydrogen Economy**
*Andy Stiny, Albuquerque Journal (1/19/22)*
The goal is to reduce emissions at least 45% below 2005 levels by 2030 as outlined in an executive order from Gov. Michelle Lujan Grisham, according to a joint news release from the New Mexico departments of Energy, Minerals and Natural Resources, as well as Economic Development and Environment. Los Alamos and Sandia National laboratories joined in the statement.

**Waste Isolation Pilot Plant Plans for 30 Nuke Waste Shipments from Los Alamos Lab in 2022**
*Carlsbad Current-Argus (1/20/22)*
Officials at the U.S. Department of Energy said they hope to dispose of 30 shipments of nuclear waste this year from Los Alamos National Laboratory in northern New Mexico at the Waste Isolation Pilot Plant near Carlsbad.

**New Mexico Partners with Los Alamos, Sandia National Labs to Develop 'Clean' Hydrogen Power**
*Alamogordo Daily News (1/19/22)*
New Mexico's national laboratories could help develop the state's growing hydrogen power industry, a major objective of the State of New Mexico's administration going into the 2022 Legislative Session. New Mexico Gov. Michelle Lujan Grisham and her cabinet touted hydrogen energy as a means to diversify the state's economy while also providing a new, low-carbon energy source.

**State Agencies, National Labs Team Up in Zero-Carbon Hydrogen Effort**
*NM Political Report (1/24/22)*
The national labs are no strangers to hydrogen. John Sarrao, deputy director for science, technology, and engineering at Los Alamos, said the lab has been working on hydrogen for about 40 years and has developed technology that is currently being deployed in pilot projects.

**How a Mighty Volcanic Eruption Sent Enormous Pressure Waves All Around Earth**
*Mashable (1/22/22)*
The atmosphere acted like a fluid because the atmosphere is actually a fluid. It's not as dense as a liquid, but gas particles react to temperature, pressure, and things flowing through in similar ways, explained Phil Blom, an expert in acoustics and geophysics research at Los Alamos National Laboratory.

**Scientists Probe Huge Crater on 'Psyche,' The Massive Metal Asteroid Worth More Than Our Global Economy**
*Forbes (1/25/22)*
The theory goes that something smashed into 16 Psyche a few billion years ago, creating a massive crater about four miles deep and 33 miles wide. Running for a few days on up to 3,000 cores of a Los Alamos supercomputer, a new visualization by Los Alamos National Laboratory simulates what happened in the 400 seconds after 16 Psyche was struck by something.